



RAZOR SHARP

Bachmann controller automates the core process
in electric shaver production

The most important quality criterion of an electric shaver and thus the secret of a good shave is the design of the shaver head and the rotating blades inside it. The controls for the equipment used to manufacture the blades, for feeding the blades and also for assembling them on the production line were developed by the Dutch engineering company BrainCenter, which has belonged to the Irmato Group since 2010. The core of the automation required for this is provided by the Bachmann automation system. For the customer, the openness of the solution was a particularly impressive feature.

As an engineering company and machine building consultancy, the Irmato Group develops and implements customized concept solutions for the mechatronics, electronics, drive and control engineering sectors. It also provides the automation of the production lines for electric shavers at Philips based in Drachten, Netherlands. Millions of these luxury shavers leave this plant every year.

A look inside the production halls clearly shows the effort required to survive with maximum cost efficiency in this extremely price critical and hard-fought market: As many processes as possible are run in parallel, and the assembly lines are designed so that they can at least continue to produce with a reduced output in the event of a fault.

Performance – and highest quality

Irmato decided on a setup with parallel turntables for the systems used for feeding the blades and pre-assembling the shaver heads.

“This architecture fits perfectly into the overall assembly process,” explains Kor Buursma, head of the engineering department at Irmato Drachten. “One of the aspects involved,” Kor Buursma continues, “is the fact that the changeover to a new product can be completed very quickly, since the free-standing turntable makes every process step accessible.” At the same time the capacity of the material buffer required for the assembly line and the desired blade quality are ensured. Due to the capacity required, two turntables are connected to each conveyor, and production can even continue running with only one unit at a reduced output.

Complex assembly

The blades for electric shavers are very complex structures, consisting of a number of minute parts and springs that combine to form the shaver head. “In all, six process steps are required for their assembly,” Kor Buursma explains. Video cameras are used to monitor and control the quality of the blades and their assembly on the turntable, until a fully assembled shaver head is further conveyed after a short time onto the remaining production line.

Open system – and a lively partnership

“Over the years, Irmato developed for the construction of different turntable systems a preference for specific components from various suppliers with whom we were able to work successfully,” explains the development manager. “We intentionally don’t want to restrict ourselves to individual manufacturers but to always use the best components for the application concerned.”

This also determined one of the basic requirements for the automation system to be selected: It must be open for the various third party systems and also offer a wide range of interfaces. “At the same time, however, we also need a partner who is ready to support us in

the complex integration of components that have often been specially developed for us,” says Kor Buursma, “a service that not every vendor can offer.” Not so with Bachmann: “Ronald Epskamp, account manager at Bachmann electronic, had no reservations,” Kor Buursma explains, “with the MX213 he supplied us with a system CPU that can communicate directly via Ethernet and CAN bus,

» Open automation solutions should serve the plant builder and not the other way round. «

Kor Buursma, head of the engineering department at Irmato Drachten



Headquartered in Stramproy, Netherlands, the Irmato Group is a multidisciplinary engineering and consulting company specializing in the field of machine and equipment building, vehicle construction and the process industry. Irmato has around 300 employees at ten sites in the Netherlands, Germany and Belgium.

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▲ Controlled with cameras: Production quality and parts orientation are monitored during shaver head assembly.

and is supplemented with an additional module for PROFIBUS and the local I/Os. This CPU also handles the control of the safety circuit at the same time." The modular design helps Irmato to implement the wide range of requirements of their customers and add any plant expansions without any problems.

Integrated safety

For Irmato, the integration of the safety functions in the controller was also another key benefit. "This solution

enables us to virtually 'program' the safety. Any complex additional wiring becomes unnecessary as we have all the status information about the system available on the PLC - for example, even whether a door is open or closed," adds René van Delden, responsible for programming at Irmato Drachten.

Incorporated in the higher-level system

The turntables are integrated in the high-level factory management system

used at Philips. A task that was also implemented on the Bachmann CPU. This enables status messages, recipes or information about overall equipment effectiveness, OEE, to be exchanged. At the same time, quality-related parameters such as about the manufacture of the blades are transferred.

Flexibility in all directions

Kor Buursma is very pleased with the new controller heart of his machine. "The Bachmann automation system fits the Irmato design philosophy perfectly. Whilst we want to standardize on the one hand, we aim at the same time to maintain flexibility in terms of functions, suppliers and plant communication.

The modular design of the Bachmann solution meets all these criteria. We are thus not only able to adapt our turntable concept very easily to the functional requirements of our customers, but we can also implement the connection to a business software already in place without any problems."



▲ Integrated safety: The inputs and outputs for the safety-related signals are directly integrated in the controller.